Sump Services Inc. (SSI)
Universal In-Service Repair Kit

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Technical Consultant

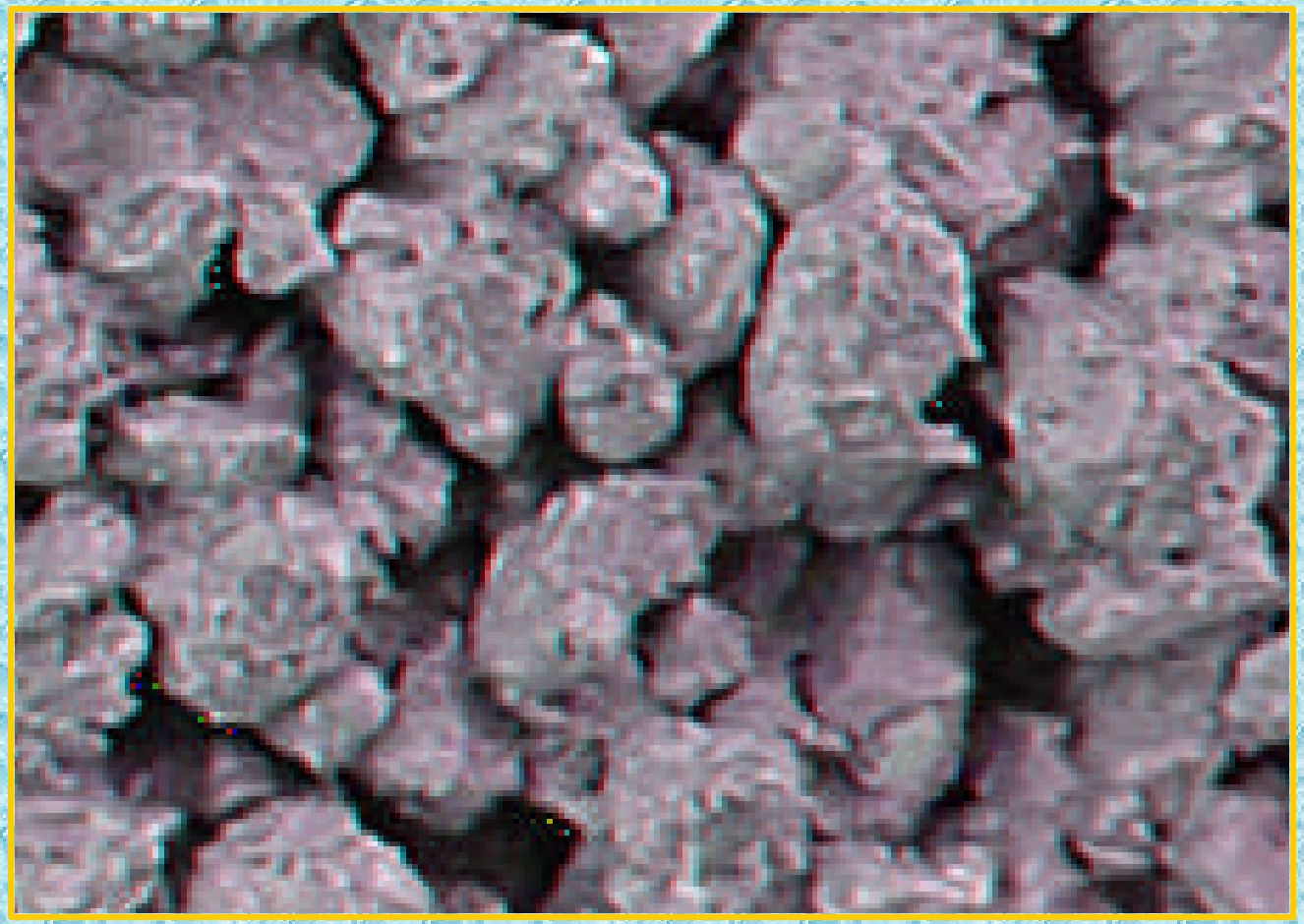
Who am I?

- **Polymer chemist and mechanical engineer**
- **Hold 14 patents on petroleum equipment products, including sumps, secondary piping systems and flexible entry boots**
- **Primary duties are with the cement industry (let's talk cool communities sometime - did you know that concrete parking lots substantially reduce fugitive hydrocarbon emissions from the gas tanks of parked cars?! – or pervious concrete for first flush pollution mitigation)**

Why Am I Here?

- I've spent over a decade in the petroleum equipment industry designing for environmental security
- I believe in the need for reliable secondary containment systems for fueling installations
- I believe in the efficacy and value of the SSI system
- And ……..

I Want To Keep Wally Healthy!!!



Keeping Sumps Dry
&
Groundwater Clean!

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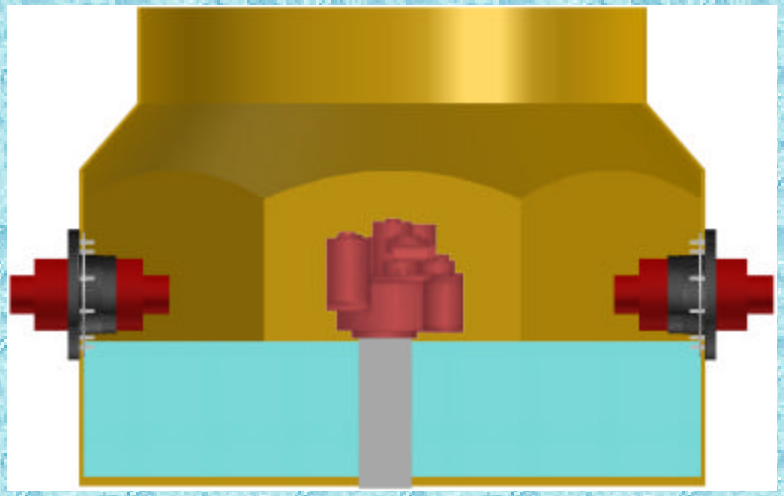

If groundwater water can enter the containment sump ----

then fuel can escape the sump and contaminate the groundwater!!

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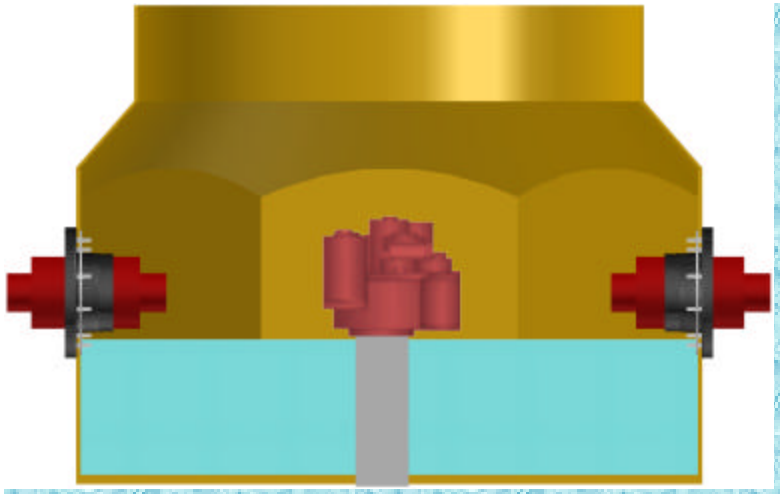

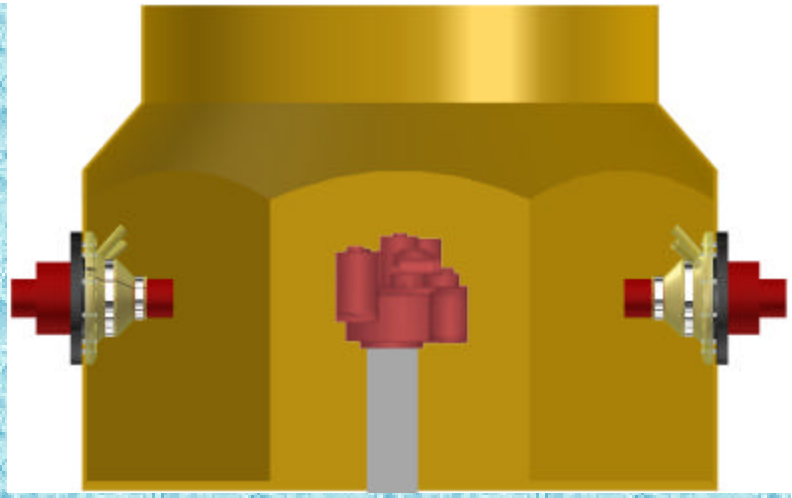

Repairing leaking pipe and conduit entries remedies nearly 90% of all sump leaks.

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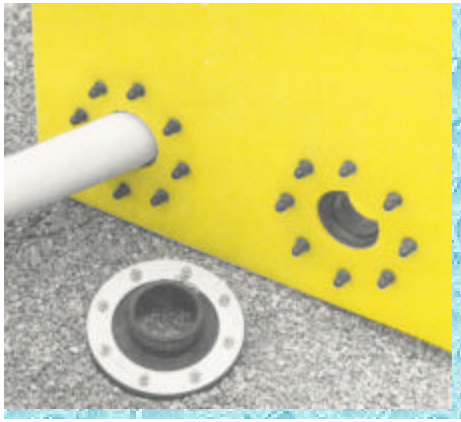

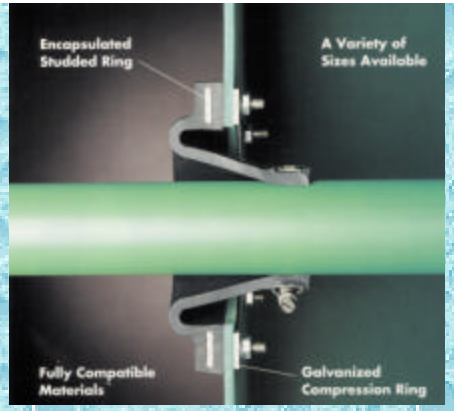

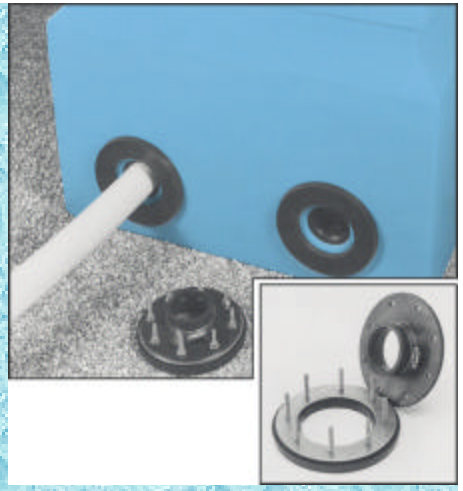

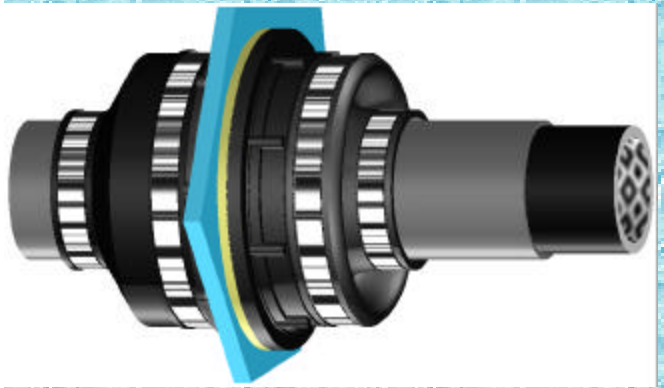

Every manufacturer of underground piping offers a line of pipe and conduit entry fittings.

Most are manufactured from nitrile rubber or TPO – and many if not most will fail within the first 5 - 10 years of service – if for no other reason than the fact that many entry fittings are damaged by workers using them as footholds.

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SSI encapsulates the existing entry fitting with a Pellethane bonded overboot.

This boot is then pressure filled with a proven moisture-curing sealant as a tertiary, redundant sealing mechanism.

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Which takes most sumps from wet to dry – and all without disruption to the station or breaking concrete!

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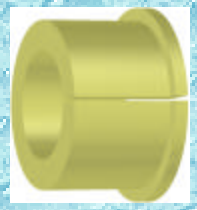

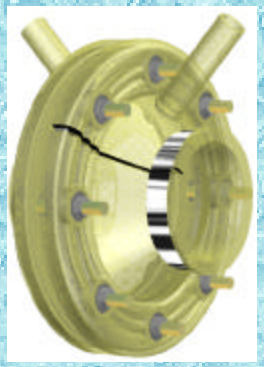
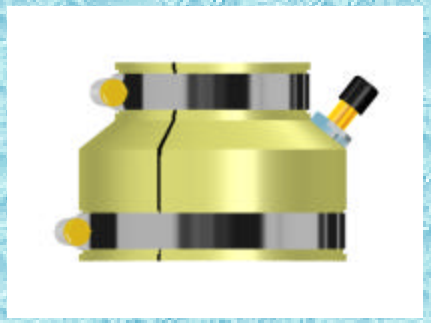

The SSI product line provides the flexibility to fix almost any leaking penetration – regardless of system manufacturer.

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Materials Make The Difference

- There are many different kinds of nitrile rubber
- They all have in common that they are subject to oxidative degradation
- The longest-lived nitrile rubber certified by the air force is 10 years – most are 1, 3 or 5 year materials.
- Oxidative degradation is reduced in nitrile by using waxy additives – but these additives dissolve in gasoline or fuel vapors.

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Materials Make The Difference

- Commonly used TPOs are resistant to oxidative degradation
- Lack of polar moieties provides resistance to water and polar compounds such as alcohols, but provides for high swell in hydrocarbons, especially aromatics
- TPOs are difficult to bond to, so repairs other than encapsulative will eventually fail.

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Materials Make The Difference

- SSI repair boots are made from a Pellethane urethane based material.
- The Pellethane has both polar and non-polar segments, but is semi-crystalline to provide the best balance of flexibility and chemical resistance.
- Pellethane is expensive and more difficult to process than nitrile and TPO.

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Materials Make The Difference

- SSI repair boots are filled with Bostik 1100 moisture-cured urethane sealant.
- Moisture-cured sealants gain in molecular weight during water exposure.
- The 1100 formulation is among the most fuel-resistant workable sealants available.

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Bostik 1100
But I Just Heard That This Stuff Is No Good In Gas!

- **Bostik 1100 has been used for 20 years by the industry as the best available sealant which is both water and fuel resistant.**
- **SSI uses Bostik 1100 as a tertiary , redundant seal – the primary seal (except right where the leak is!) is the existing boot. The secondary seal is the SSI Pellethane boot. The Bostik 1100 provides a redundant, tertiary seal.**
- **This tertiary seal will probably never see fuel – but if it does, the slight swelling which occurs will provide further sealing action.**

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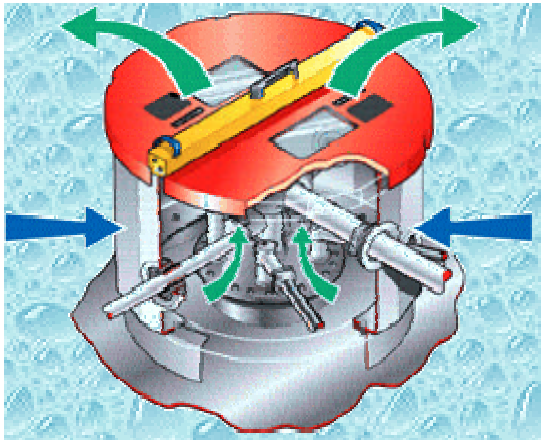
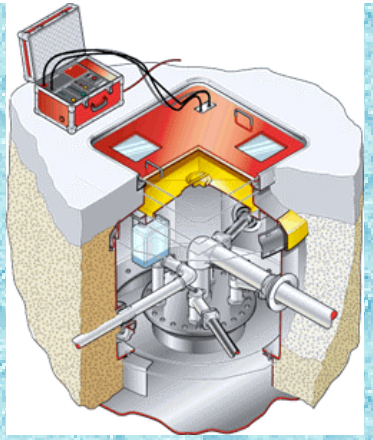


Testing



Traditionally, leak testing is performed by filling the sump with water and monitoring over 24 hours.

While this certainly mimics the situation of most concern – a sump full of fuel – it is time-consuming and can be affected by external groundwater levels. You also generate hundreds of gallons of contaminated water per site with every test.

SSI has evaluated vacuum testing of sumps and spill-containments. SSI repairs pass vacuum testing.

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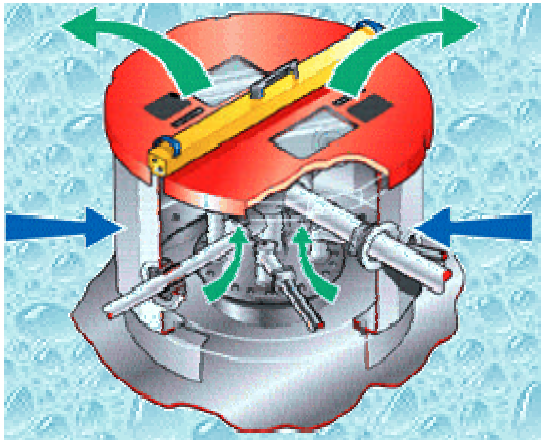

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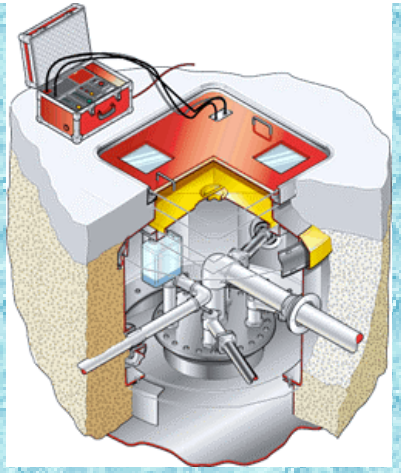

Crompco, an east coast firm, routinely performs vacuum testing on sumps and spill containments for major oil firms in their area, and remediates leaking entry fittings with the SSI system.

Most installations are tested and repaired by a two-man crew in a day or less without breaking concrete.

Vacuum testing detects holes as small as 0.008” – a hole so small that the surface tension of water or fuel is such that a leak would not occur at STP.

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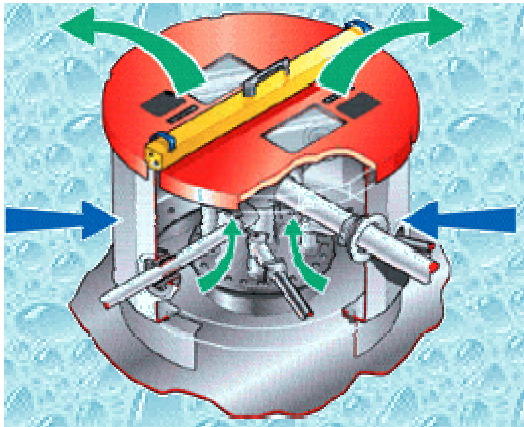

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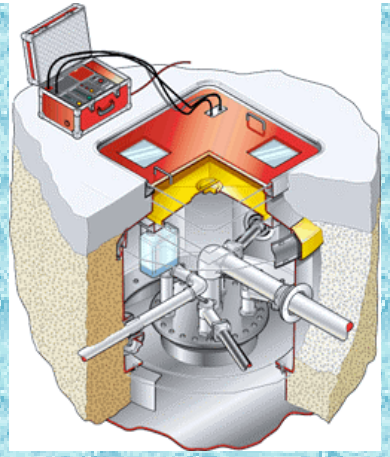

SSI, during its four years of use in California (and worldwide), has been subjected to hydrostatic as well as vacuum testing by a number of the leading testing firms.

Retests after months or even years of service have shown that this repair system stands the test of time.

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Training

- SSI certifies installers with on-site training
- Training manual covers virtually every penetration manufacturer's system
- On-site, on-the-job training ensures that the first job goes well, and provides the confidence level for the installer to continue on his/her own
- Toll-free number provided for service and technical support

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Summary

SSI supplies a proven technology with years of application and testing experience. Leaking sump penetrations can be fixed economically, without interrupting service, and with the highest level of confidence in environmental security.

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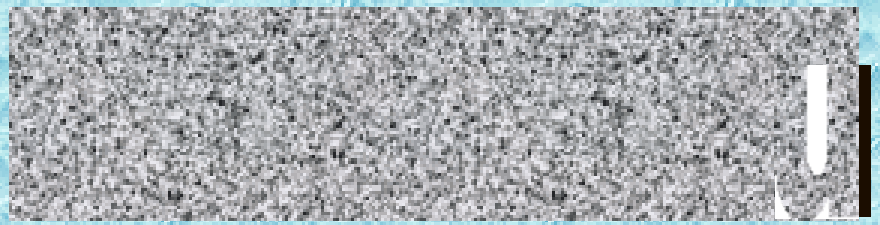

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